

PATENT ABSTRACTS OF JAPAN

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(54) DISPLAY DEVICE

(57)Abstract:

PURPOSE: To provide the display device which is low in cost and reducible in size and thickness and can suppress unwanted ration.

CONSTITUTION: This display device is equipped with a liquid crystal panel 16 which displays a pattern corresponding to display data, data signal lines 11a and 11b which transmit the display data A and display data B having the opposite polarity from the display data A respectively, signal drivers A12a and signal driver B12b which display the pattern on the liquid crystal panel 16 according to the respective sent display data A and B, and a scanning driver 13 which drives scanning electrodes 15 of the liquid crystal panel 16. In another way, out-of-phase data other than the data with the opposite polarity may be used.

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CLAIMS

[Claim(s)]

[Claim 1] With a display means to display the pattern according to a data signal, and two or more signal lines A data signal transmission means to shift and transmit a phase to the data signal transmitted with other signal lines in the data signal transmitted with at least one signal line in case a original data signal is divided and transmitted to plurality, The display characterized by having a display conversion means to display a pattern on said display means, based on the transmitted data signal.

[Claim 2] With a display means to display the pattern according to a data signal, and two or more signal lines A data signal transmission means to transmit the data signal transmitted with at least one signal line as reversed polarity or reverse logic to the data signal transmitted with other signal lines in case a original data signal is divided and transmitted to plurality, The display characterized by having a display conversion means to display a pattern on said display means, based on the transmitted data signal.

[Claim 3] A display conversion means is a display according to claim 2 characterized by having a reversal means to reverse the polarity of a data signal or logic transmitted with at least one signal line.

[Claim 4] Claim 2 to which the signal by said data signal transmitted in parallel negated mutually is characterized by being the displaying point or viewing area on the screen of said display means which adjoins mutually, or a display given in three.

[Claim 5] With a display means to drive with a driving signal and to display the pattern according to a data signal, and two or more signal lines A drive signal-transmission means to shift and transmit a phase to the driving signal transmitted with other signal lines in the driving signal transmitted with at least one signal line in case a original driving signal is divided and transmitted to plurality, The display characterized by having the display driving means which displays a pattern on said display means according to the transmitted driving signal.

[Claim 6] With a display means to drive with a driving signal and to display the pattern according to a data signal, and two or more signal lines A drive signal-transmission

means to transmit the driving signal transmitted with at least one signal line as reversed polarity or reverse logic to the driving signal transmitted with other signal lines in case a original driving signal is divided and transmitted to plurality, The display characterized by having the display driving means which displays a pattern on said display means according to the transmitted driving signal.

[Claim 7] A display conversion means is a display according to claim 6 characterized by having a reversal means to reverse the polarity of a driving signal or logic transmitted with at least one signal line.

[Claim 8] With a display conversion means to display the display pattern corresponding to an indicative data on the screen, and two or more signal lines A data signal transmission means to shift and transmit a phase with values other than reversed polarity to the data signal transmitted with other signal lines in the data signal transmitted with at least one signal line in case a original data signal is divided and transmitted to plurality, The display characterized by having a display conversion means to display a pattern on said display means, based on the transmitted data signal.

[Claim 9] A display conversion means is a display according to claim 8 characterized by having the conversion means which shifts the phase of the data signal transmitted with at least one signal line with values other than reversed polarity.

[Claim 10] With a display means to drive with a driving signal and to display the display pattern corresponding to a data signal on the screen, and two or more signal lines A transmission means to shift and transmit a phase with values other than reversed polarity to the driving signal transmitted with other signal lines in the driving signal transmitted with at least one signal line in case a original driving signal is divided and transmitted to plurality, The display characterized by having a display conversion means to display a pattern on said display means, according to the transmitted driving signal.

[Claim 11] A display conversion means is a display according to claim 10 characterized by having the conversion means which shifts the phase of the driving signal transmitted with at least one signal line with values other than reversed polarity.

[Claim 12] A driving signal is a display claims 5, 6, 7, and 10 characterized by being a clock signal and/or a control signal, or given in 11.

[Claim 13] A display means is a display according to claim 1 to 12 characterized by being a liquid crystal display component.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the display used as a display of information machines and equipment, such as visual equipments, such as television, and a computer.

[0002]

[Description of the Prior Art] Drawing 9 is the block diagram showing the configuration of the conventional liquid crystal display. For a signal driver and 55, as for a liquid crystal panel and 57, in drawing 9, a scan driver and 56 are [the clock signal line by which 51 transmits a clock signal, the data signal line by which 52 transmits an indicative data, the control signal line by which 53 transmits a control signal, and 54 / the signal electrode of a liquid crystal panel 56 and 58] the scan electrodes of a liquid crystal panel 56.

[0003] Actuation of the conventional liquid crystal display constituted as mentioned above is explained below. In drawing 9, with a clock signal and a control signal, the signal driver 54 incorporates an indicative data and outputs a signal level to each signal electrode 57 of a liquid crystal panel 56. On the other hand with a control signal, the scan driver 55 outputs a scan electrical potential difference to each scan electrode 58 of a liquid crystal panel 56. Sequential selection of every one scan electrode 58 of a liquid crystal panel 56 is made by this scan electrical potential difference, and the display pattern corresponding to an indicative data can be displayed on a liquid crystal panel 56 by line sequential scanning (bibliography and

"flat-panel display:1990" Nikkei Business Publications).

[0004]

[Problem(s) to be Solved by the Invention] However, in the above configuration indicating equipments, when the number of display pixels of a liquid crystal panel is large, the transfer frequency of an indicative data becomes very high, and the frequency of a clock signal or a control signal also becomes very high in connection with this. This frequency will be set to several 10MHz or more if the number of display pixels generally becomes about 1 million pixels. Therefore, the technical problem that it becomes easy to generate spurious radiation, such as an electromagnetic wave, from a data signal line, a clock signal line, and a control signal line occurs. This spurious radiation becomes the cause of having bad influences, such as a display failure and a noise failure, on television, a radio set, etc.

[0005] In order to press down this spurious radiation, although reduction is possible, the technical problem that a miniaturization and thin-shape-izing of a display benefit this cure difficult, or it becomes a cost rise occurs as carrying out a data signal line and a clock signal line, and coping with electromagnetic shielding etc. at a control signal line.

[0006] In consideration of such a technical problem of the conventional display, this invention is low cost, can perform miniaturization and thin shape-ization and aims at offering the display which can control generating of spurious radiation.

[0007]

[Means for Solving the Problem] This invention of claim 1 with a display means to display the pattern according to a data signal, and two or more signal lines A data signal transmission means to shift and transmit a phase to the data signal transmitted with other signal lines in the data signal transmitted with at least one signal line in case a original data signal is divided and transmitted to plurality, It is the display characterized by having a display conversion means to display a pattern on said display means, based on the transmitted data signal.

[0008] With a display means to drive this invention of claim 5 with a driving signal, and to display the pattern according to a data signal, and two or more signal lines A drive signal-transmission means to shift and transmit a phase to the driving signal transmitted with other signal lines in the driving signal transmitted with at least one signal line in case a original driving signal is divided and transmitted to plurality, It is the display characterized by having the display driving means which displays a pattern on said display means according to the transmitted driving signal.

[0009]

[Function] This invention of claim 1 is in the condition to which the data-signal transmission means shifted the phase with two or more signal lines to the data signal transmitted with other signal lines in the data signal which transmits a original data signal with at least one signal line, and divides and transmits to plurality, a display conversion means displays a pattern on a display means based on the transmitted data signal, and a display means displays the pattern according to a data signal.

[0010] This invention of claim 5 is in the condition to which the drive signal-transmission means shifted the phase with two or more signal lines to the driving signal transmitted with other signal lines in the driving signal which transmits a original driving signal with at least one signal line. It divides and transmits to plurality, and a display driving means displays a pattern on a display means according to the transmitted driving signal, and a display means displays the pattern according to a data signal by the drive of a driving signal.

[0011]

[Example] Below, this invention is explained based on the drawing in which the example is shown.

[0012] Drawing 1 is the block diagram showing the configuration of the indicating equipment of the 1st example concerning the 1st this invention. The data signal line by which 11a transmits indicative-data A in drawing 1 , the data signal line by which 11b transmits indicative-data B of reverse logic to indicative-data A, The signal driver B to which the signal driver A to which 12a processes indicative-data A, and 12b process indicative-data B The scan driver to which 13 scans with a control signal, the liquid crystal panel with which 16 displays the pattern according to an indicative data, The signal electrode of the liquid crystal panel 16 by which 14a is connected to the output of signal driver A12a, The signal electrode of the liquid crystal panel 16 by which 14b is connected to the output of signal driver B12b, the scan electrode of the liquid crystal panel 16 by which 15 is connected to the output of the scan driver 13, the clock signal line by which 17 transmits a clock signal, and 18 are control signal lines which transmit a control signal. The above-mentioned data signal lines 11a and 11b constitute a data signal transmission means, and signal driver A12a and signal driver B12b constitute the display conversion means.

[0013] In the display of the above-mentioned example constituted as mentioned above, the actuation is explained below.

[0014] Now, it is generated by carrying out sending out, after accumulating indicative-data A in memory in order that the logic data of positive logic and indicative-data B may be logic data of negative logic, and it may divide a original data

signal into two and may make timing of transmission coincidence further for example, etc. Here, the indicative-data input terminal of signal driver A12a outputs the electrical potential difference which positive logic actuation is carried out, for example, makes a liquid crystal panel 16 turn on when an input indicative data is "1" level. On the other hand, the indicative-data input terminal of signal driver B12b outputs the electrical potential difference which negative logic actuation is carried out, for example, makes a liquid crystal panel 16 turn on when an input indicative data is "0" level.

[0015] Indicative-data A and indicative-data B which have been respectively transmitted through the data signal lines 11a and 11b are respectively incorporated by signal driver A12a and signal driver B12b synchronizing with a clock signal and a control signal, and impress the signal level of every one line to signal electrodes 14a and 14b respectively. At this time, the scan driver 13 makes sequential selection of the scan electrode 15 synchronizing with a control signal, and displays the pattern according to indicative datas A and B on a liquid crystal panel 16 by line sequential scanning.

[0016] Moreover, since signal driver A12a and signal driver B12b are respectively connected to each oddth and even-numbered signal electrodes 14a and 14b, indicative-data A and indicative-data B are the indicative datas corresponding to the displaying point which adjoins mutually.

[0017] Generally the display information in 1 screen of the display screen has correlation to some extent, and this correlation becomes very strong when it is especially graphic display. Therefore, the indicative data transmitted to juxtaposition is the almost same data in this time of day in many cases. From the above thing, by making each indicative data of two groups into the indicative data of a contiguity pixel respectively, correlation of each groups' data becomes still stronger, and can consider as the indicative data of nearly perfect reverse logic into each groups. That is, indicative-data A and indicative-data B are reversed polarity mutually almost electrically in this time of day, the unnecessary electromagnetic wave generated from the data signal lines 11a and 11b is negated mutually, and most unnecessary electromagnetic waves etc. are no longer radiated.

[0018] Drawing 2 is the block diagram showing the configuration of the indicating equipment in the 2nd example concerning the 1st this invention. The data signal line by which 21a transmits indicative-data A in drawing 2, the data signal line by which 21b transmits indicative-data B of reverse logic to indicative-data A, The inverter circuit where 22 carries out logic reversal of the indicative-data B of data signal line

21b, Each signal driver to which 23 processes each indicative data, and 25 A scan driver, The signal electrode of the liquid crystal panel 27 by which 27 is connected to a liquid crystal panel and 24 is connected to the output of the signal driver 23, the scan electrode of the liquid crystal panel 27 by which 26 is connected to the output of the scan driver 25, the clock signal line by which 28 transmits a clock signal, and 29 are control signal lines which transmit a control signal. The above-mentioned data signal lines 21a and 21b constitute a data signal transmission means, and the inverter circuit 22 which are the signal driver 23 and a reversal means constitutes the display conversion means.

[0019] In the display of the 2nd example constituted as mentioned above, the actuation is explained below.

[0020] Now, indicative-data A is logic data of negative logic, and the logic data of positive logic and indicative-data B are generated like the case of the 1st example. The indicative-data input terminal of the signal driver 23 carries out positive logic actuation, for example, the electrical potential difference which makes a liquid crystal panel 27 turn on when an input indicative data is "1" level is outputted here, and the signal driver 23 of two upper and lower sides is the same. Although the signal driver 23 incorporates an indicative data synchronizing with a clock signal and a control signal, after indicative-data B is changed into the data of positive logic by the inverter circuit 22, it is incorporated by the signal driver 23. And the signal level of every one line is respectively impressed to a signal electrode 24. At this time, the scan driver 25 makes sequential selection of the scan electrode 26 synchronizing with a control signal, and displays the pattern according to indicative datas A and B on a liquid crystal panel 27 by line sequential scanning.

[0021] In the 2nd example as well as the 1st example shown in drawing 1 , indicative-data A and indicative-data B are reversed polarity mutually almost electrically in this time of day, the unnecessary electromagnetic wave generated from the data signal lines 21a and 21b is negated mutually, and most unnecessary electromagnetic waves etc. are no longer radiated. Moreover, a normal display can be obtained by polarity reversals or very easy processing in which logic reversal is carried out.

[0022] Drawing 3 is the block diagram showing the configuration of the indicating equipment in the 3rd example concerning the 1st this invention. The data signal line by which 31a and 31b transmit an indicative data in drawing 3 , 32a the signal driver B and 34a for the signal driver A and 32b The scan driver A The signal electrode which drives the upper half of the liquid crystal panel 39 by which 34b is connected to the

scan driver B for a liquid crystal panel and 33a, and 39 is connected to the output of signal driver A32a, The signal electrode with which 33b drives the lower half of the liquid crystal panel 39 connected to the output of signal driver B32b, The scan electrode with which 35a drives the upper half of the liquid crystal panel 39 connected to the output of scan driver A34a, The scan electrode with which 35b drives the lower half of the liquid crystal panel 39 connected to the output of scan driver B34b, The clock signal line by which 37a transmits clock signal A, the clock signal line by which 37b transmits clock signal B, the control signal line by which 38a transmits a control signal A, and 38b are control signal lines which transmit a control signal B. Above-mentioned clock signal lines 37a and 37b and control signal lines 38a and 38b constitute a drive signal-transmission means, and signal driver A32a, signal driver B32b, scan driver A34a, and scan driver B34b constitute the display driving means.

[0023] In the display of the 3rd example constituted as mentioned above, the actuation is explained below.

[0024] The logic signal of positive logic, clock signal B, and the control signal B of now and clock signal A and a control signal A are logic signals of negative logic. Are reversed. Divide, and while the original clock signal and the original control signal were divided, for example, consider as clock signal B and a control signal B as reverse logic, or Or a original clock signal and a original control signal are made into clock signal A and a control signal A, and the signal which was able to shift the phase of a original clock signal and a original control signal 180 degrees is generated as clock signal B and a control signal B. Here, the input terminal of the clock signal and control signal of signal driver A32a carries out positive logic actuation, and the input terminal of the clock signal and control signal of signal driver B32b carries out negative logic actuation. Moreover, the input terminal of the control signal of scan driver A34a carries out positive logic actuation, and the input terminal of the control signal of scan driver B34b carries out negative logic actuation. An indicative data is respectively incorporated by signal driver A32a and signal driver B32b synchronizing with a clock signal and a control signal, and impresses the signal level of every one line to signal electrodes 33a and 33b respectively. At this time, scan driver A34a and scan driver B34b make sequential selection of scan electrode 35a and the scan electrode 35b respectively at coincidence synchronizing with a control signal A and a control signal B, carry out line sequential scanning for the upper half and lower half of a liquid crystal panel 39 to coincidence respectively, and display the pattern according to an indicative data on a liquid crystal panel 39.

[0025] As mentioned above, since clock signal A, clock signal B and a control signal A,

and a control signal B are logic signals of reverse logic mutually, respectively, it is reversed polarity mutually electrically, the unnecessary electromagnetic wave respectively generated from the clock signal lines 37a and 37b and the control signal lines 38a and 38b is negated mutually, and an unnecessary electromagnetic wave etc. is no longer radiated from the clock signal lines 37a and 37b and the control signal lines 38a and 38b.

[0026] Drawing 4 is the block diagram showing the configuration of the indicating equipment in the 4th example concerning the 1st this invention. The data signal line by which 41a and 41b transmit an indicative data in drawing 4, 42a and 42b the scan driver A and 44b for a signal driver and 44a The scan driver B The signal electrode respectively corresponding to the upper half and lower half of a liquid crystal panel and the liquid crystal panel 49 by which 49 is connected to 43a and 43b is respectively connected to the output of the signal drivers 42a and 42b, The scan electrode with which 45a drives the upper half of the liquid crystal panel 49 connected to the output of scan driver A44a, The scan electrode with which 45b drives the lower half of the liquid crystal panel 49 connected to the output of scan driver B44b, The clock signal line by which 47a transmits clock signal A, the clock signal line by which 47b transmits clock signal B, The control signal line by which 48a transmits a control signal A, the control signal line by which 48b transmits a control signal B, and 40 are inverter circuits which reverse the logic of the clock signal of clock signal line 47b, and the logic signal of the control signal of control signal line 48b. Above-mentioned clock signal lines 47a and 47b and control signal lines 48a and 48b constitute a drive signal-transmission means, and the signal drivers 42a and 42b, scan driver A44a, scan driver B44b, and an inverter circuit 40 constitute the display driving means.

[0027] In the display of the 4th example constituted as mentioned above, the actuation is explained below.

[0028] Now, clock signal A and a control signal A are logic signals of negative logic, and the logic signal of positive logic, clock signal B, and a control signal B are generated like the case of the 3rd example. The signal drivers 42a and 42b are signal drivers of the same configuration, and the input terminal of a clock signal and a control signal carries out positive logic actuation. On the other hand, clock signal B of negative logic and a control signal B are respectively changed into the logic signal of positive logic by the inverter circuit 40, and are inputted into signal driver 42b and scan driver B44b. An indicative data is incorporated by the signal drivers 42a and 42b synchronizing with a clock signal and a control signal, and the signal level of every one line is respectively impressed to signal electrodes 43a and 43b. At this time, scan

driver A44a and scan driver B44b make sequential selection of scan electrode 45a and the scan electrode 45b respectively at coincidence synchronizing with a control signal A and a control signal B, carry out line sequential scanning for the upper half and lower half of a liquid crystal panel 49 to coincidence respectively, and display the pattern according to an indicative data on a liquid crystal panel 39.

[0029] As mentioned above, since clock signal A, clock signal B and a control signal A, and a control signal B are logic signals of reverse logic mutually, respectively, it is reversed polarity mutually electrically, the unnecessary electromagnetic wave respectively generated from the clock signal lines 47a and 47b and the control signal lines 48a and 48b is negated mutually, and an unnecessary electromagnetic wave etc. is no longer radiated from the clock signal lines 47a and 47b and the control signal lines 48a and 48b. Moreover, a clock signal and a control signal are convertible for a normal signal with easy processing called logic reversal.

[0030] As mentioned above, since according to the 1st this invention it constitutes so that the unnecessary electromagnetic wave generated from each signal line of an indicative data or a clock signal, and a control signal may be negated with each signal lines of two groups, radiation of the unnecessary electromagnetic wave leading to display failures, such as television and a radio set, or a noise failure etc. can be reduced remarkably.

[0031] Below, the 2nd this invention is explained.

[0032] Drawing 5 is the block diagram showing the configuration of the indicating equipment in the 1st example of the 2nd this invention. The data signal line A by which 111a transmits indicative-data A in drawing 5 The data signal line B by which 111b transmits indicative-data B from which indicative-data A and a phase have shifted in values other than reversed polarity 112a the signal driver B and 113 for the signal driver A and 112b A scan driver, The signal electrode A of the liquid crystal panel 116 by which a liquid crystal panel and 114a are connected to the output of the signal driver A for 116 The signal electrode B of the liquid crystal panel 116 by which 114b is connected to the output of the signal driver B The scan electrode of the liquid crystal panel 116 by which 115 is connected to the output of the scan driver 113, The clock signal line A by which 117a transmits the clock signal of the same timing as indicative-data A The clock signal line B by which 117b transmits the clock signal of the same timing as indicative-data B The control signal line B by which the control signal line A by which 118a transmits the control signal of the same timing as indicative-data A, and 118b transmit the control signal of the same timing as indicative-data B, and 118c are the control signals C for scan drivers.

[0033] In the display of this example constituted as mentioned above, that actuation is explained below. In drawing 5 , the clock signal which synchronized with indicative-data A transmitted from data signal line 111a and indicative-data A transmitted from clock signal line 117a, and the control signal which synchronized with indicative-data A transmitted from control signal line 118a are sent to signal driver A112a. Moreover, the clock signal which synchronized with indicative-data B transmitted from data signal line 111b and indicative-data B transmitted from clock signal line 117b, and the control signal which synchronized with indicative-data B transmitted from control signal line 118b are sent to signal driver B112b. And it is incorporated by Driver A and the signal driver B, and the signal level of every one line is respectively impressed to signal electrodes 114a and 114b. At this time, the scan driver 113 makes sequential selection of the scan electrode 115 synchronizing with control signal 118c, and displays on a liquid crystal panel by line sequential scanning.

[0034] Furthermore, since the signal driver A and the signal driver B are respectively connected to each oddth and even-numbered signal electrode, indicative-data A and indicative-data B are the indicative datas corresponding to the displaying point which adjoins mutually.

[0035] Therefore, as mentioned above, since the phase has shifted in values other than reversed polarity, as for indicative-data A and indicative-data B, coincidence switching operation is not performed in this time of day. Therefore, electric distribution is performed, the unnecessary electromagnetic wave by the switching operation generated from the data signal lines 111a and 111b etc. is distributed, and most unnecessary electromagnetic waves etc. are no longer radiated.

[0036] Drawing 6 is the block diagram showing the configuration of the indicating equipment in the 2nd example of the 2nd this invention. The data signal line A by which 121a transmits indicative-data A in drawing 6 The data signal line B by which 121b transmits indicative-data B, and 129 Indicative-data B, The phase conversion circuit which gives [that of a clock signal and a control signal] phase contrast for a phase with values other than reversed polarity, 122a the signal driver B and 123 for the signal driver A and 122b A scan driver, The signal electrode of the liquid crystal panel 126 by which 126 is connected to a liquid crystal panel and 124a and 124b are connected to the output of a signal driver, The scan electrode of the liquid crystal panel 126 by which 125 is connected to the output of the scan driver 123, the clock signal line which transmits the clock signal with which 127 synchronizes with indicative-data A, and 128a are control signal lines which transmit the control signal which synchronizes with indicative-data A.

[0037] In the display of the 2nd example constituted as mentioned above, the actuation is explained below. In drawing 6 , since the phase has not shifted if it remains as it is in order to incorporate an indicative data synchronizing with a clock signal and a control signal, coincidence switching operation will be performed, and the signal drivers 122a and 122b will emphasize an unnecessary electromagnetic wave etc. Therefore, after the clock signal and control signal which are used for indicative-data B and indicative-data B give phase contrast with values other than reversed polarity to indicative-data A by the phase conversion circuit 129, they are incorporated by the signal driver. And the signal level of every one line is respectively impressed to signal electrodes 124a and 124b. At this time, the scan driver 123 makes sequential selection of the scan electrode 125 synchronizing with a control signal, and displays on a liquid crystal panel 126 by line sequential scanning.

[0038] Like the 1st example shown in drawing 5 , since the phase has shifted in values other than reversed polarity, as for indicative-data A and indicative-data B, coincidence switching operation is not performed in this time of day. Therefore, electric distribution is performed, the unnecessary electromagnetic wave by the switching operation generated from the data signal lines 121a and 121b etc. is distributed, and most unnecessary electromagnetic waves etc. are no longer radiated.

[0039] Drawing 7 is the block diagram showing the configuration of the indicating equipment in the 3rd example of the 2nd this invention. The data signal line A by which 131a transmits indicative-data A in drawing 7 The data signal line B by which 131b transmits indicative-data B from which the phase has shifted in values other than reversed polarity to indicative-data A 132a the signal driver B and 133a for the signal driver A and 132b The scan driver A The signal electrode which drives the upper half of the liquid crystal panel 136 by which 133b is connected to the scan driver B for a liquid crystal panel and 134a, and 136 is connected to the output of the signal driver A, The signal electrode with which 134b drives the lower half of the liquid crystal panel 136 connected to the output of the signal driver B, The scan electrode with which 135a drives the upper half of the liquid crystal panel 136 connected to the output of the scan driver A, The scan electrode with which 135b drives the lower half of the liquid crystal panel 136 connected to the output of the scan driver B, The clock signal line A which transmits clock signal A to which 137a synchronized with indicative-data A The control signal line A and 138b which transmit the control signal A with which the clock signal line B and 138a which transmit clock signal B to which 137b synchronized with indicative-data B synchronized with indicative-data A are the control signal line B which transmits the control signal B which synchronized with

indicative-data B.

[0040] In the display of the 3rd example constituted as mentioned above, the actuation is explained below. In drawing 7 , an indicative data AB is respectively incorporated by the signal driver A and the signal driver B with the clock signal and control signal which synchronized with it, besides timing, and impresses the signal level of every one line to signal electrodes 134a and 134b respectively. At this time, the scan driver A and the scan driver B make sequential selection of scan electrode 135a and the scan electrode 135b respectively at coincidence synchronizing with a control signal A and a control signal B, and display respectively the upper half and lower half of a liquid crystal panel 136 on coincidence by carrying out line sequential scanning.

[0041] Clock signal A, clock signal B and the control signal A, and the control signal B synchronize with indicative-data A and indicative-data B, respectively. And a phase is shifted therefore related with the display of an upper half, and the display of a lower half with values other than reversed polarity. The unnecessary electromagnetic wave by the switching operation which coincidence switching operation is not performed in this time of day, but electric distribution is performed, and is respectively generated from the clock signal lines 137a and 137b and the control signal lines 138a and 138b etc. is distributed, and most unnecessary electromagnetic waves etc. are no longer radiated.

[0042] Drawing 8 is the block diagram showing the configuration of the indicating equipment in the 4th example of the 2nd this invention. The data signal line A by which 141a transmits indicative-data A in drawing 8 The data signal line B by which 141b transmits indicative-data B, and 142a and 142b A signal driver, The signal electrode respectively corresponding to the upper half and lower half of a liquid crystal panel 146 in which a scan driver and 146 are connected to a liquid crystal panel, and 144a and 144b are respectively connected to the output of the signal drivers 142a and 142b for 143a and 143b, The scan electrode respectively corresponding to the upper half and lower half of a liquid crystal panel 146 in which 145a and 145b are respectively connected to the output of the scan drivers 143a and 143b, The clock signal line B by which the clock signal line A by which 147a transmits clock signal A, and 147b transmit clock signal B The control signal line B by which the control signal line A by which 148a transmits a control signal A, and 148b transmit a control signal B 149 is a phase conversion circuit which gives phase contrast for the phase of the data signal of indicative-data B, and the clock signal and control signal of signal driver 142b with values other than reversed polarity to indicative-data A.

[0043] In the display of the 4th example constituted as mentioned above, the actuation is explained below. In drawing 8, the signal drivers 142a and 142b are signal drivers of the same configuration, in the phase conversion circuit 149, indicative-data B and clock signal B, and a control signal B can give phase contrast with values other than reversed polarity to indicative-data A, and a phase is inputted into signal driver 142b and scan driver 144b. An indicative data is incorporated by the signal drivers 142a and 142b synchronizing with a clock signal and a control signal, and impresses the signal level of every one line to signal electrodes 144a and 144b respectively. At this time, the scan driver A and the scan driver B make sequential selection of scan electrode 145a and the scan electrode 145b respectively at coincidence synchronizing with a control signal A and a control signal B, and display respectively the upper half and lower half of a liquid crystal panel 146 on coincidence by carrying out line sequential scanning.

[0044] Clock signal A, clock signal B and the control signal A, and the control signal B synchronize with indicative-data A and indicative-data B, respectively. And a phase is shifted therefore related with the display of an upper half, and the display of a lower half with values other than reversed polarity. Coincidence switching operation is not performed in this time of day, but electric distribution is performed, the unnecessary electromagnetic wave by the switching operation respectively generated from the clock signal lines 147a and 147b and the control signal lines 148a and 148b etc. is distributed, and most unnecessary electromagnetic waves etc. are no longer radiated.

[0045] In addition, in the above-mentioned example, although each used the liquid crystal panel as a display means, not only this but an EL panel, a plasma panel, or CRT may be used. Moreover, neither the configuration of each driver nor the electrode configuration of a display panel may also be limited to this, and the case of a liquid crystal panel may also be any configuration, such as a active-matrix mold and a passive-matrix mold, further.

[0046] Moreover, although the indicative data, the clock signal, and the control signal are all logic data or a logic signal in the above-mentioned example, not only this but each signal may be an analog signal. Furthermore, when control of spurious radiation is the practical range and it is good also as the signal of the reversed polarity of the level of the HARASHIN number, and different level, or a signal with which the phase shifted, for example, multiplying the HARASHIN number by (-0.9) , considering as reversed polarity and displaying with a liquid crystal panel, in the case of an analog signal, it $**$ by (-0.9) , and you may make it return it to the level of the HARASHIN number.

[0047] Moreover, although each divided the signal into two in the above-mentioned

example, it is good also as a signal with which it divided or more into three, and reversed polarity, reverse logic, or other phases shifted in at least one of signals [them]. In this case, what is necessary is just to divide each signal so that spurious radiation may decrease most.

[0048] Moreover, although the above-mentioned example shows how to have made how each divides the group of an indicative data, a clock signal, and a control signal correspond to each driver arranged up and down, it cannot be overemphasized that it is not necessary to make correspondence of a group correspond to each driver and one to one.

[0049] Moreover, although each was considered as the configuration which can control spurious radiation to both an indicative data or clock signal, and control signal in the above-mentioned example, it is easy to be natural also as a configuration control of spurious radiation can do all of not only this but an indicative data, a clock signal, and control signals.

[0050] Moreover, although the 3rd and 4th examples of invention of the above 1st explained both clock signal and control signal to the example as a driving signal which controls spurious radiation, you may be only not only this but one of signals.

[0051] Moreover, it cannot be overemphasized that it is also possible to consider the configuration of the 1st example shown in drawing 5 and the 3rd example shown in drawing 7 as the configuration which it has in coincidence.

[0052] Moreover, although each constituted the display conversion means or the display driving means from an above-mentioned example by the hardware of dedication, such as a signal driver and a scan driver, it may replace with this and the same function may be realized by software using a computer.

[0053] Furthermore, although it has in the example composition which carried out direct continuation of an indicative data, a clock signal, or the control signal to the driver, the processing circuit which performs predetermined signal processing may intervene between each signal and a driver.

[0054]

[Effect of the Invention] This invention is low cost, miniaturization and thin shape-ization can be performed so that clearly from the place described above, and radiation of the unnecessary electromagnetic wave which causes a display failure and a noise failure at television, a radio set, etc. can be reduced remarkably. Moreover, the peak current and the noise current which generate each signal in power-source Rhine since the coincidence switching operation of a status signal or a driving signal is avoided by the configuration which shifts a phase with values other than reversed

polarity and reverse logic can be reduced, and the descendant effectiveness that components, such as a bypass capacitor and a noise filter, are also reducible can also be acquired.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of the indicating equipment of the 1st example concerning the 1st this invention.

[Drawing 2] It is the block diagram showing the configuration of the indicating equipment of the 2nd example concerning the 1st this invention.

[Drawing 3] It is the block diagram showing the configuration of the indicating equipment of the 3rd example concerning the 1st this invention.

[Drawing 4] It is the block diagram showing the configuration of the indicating equipment of the 4th example concerning the 1st this invention.

[Drawing 5] It is the block diagram showing the configuration of the indicating equipment of the 1st example concerning the 2nd this invention.

[Drawing 6] It is the block diagram showing the configuration of the indicating equipment of the 2nd example concerning the 2nd this invention.

[Drawing 7] It is the block diagram showing the configuration of the indicating equipment of the 3rd example concerning the 2nd this invention.

[Drawing 8] It is the block diagram showing the configuration of the indicating equipment of the 4th example concerning the 2nd this invention.

[Drawing 9] It is the block diagram showing the configuration of the conventional liquid crystal display.

[Description of Notations]

11a, 11b, 21a, 21b Data signal line

12a [] the signal driver A

12b [] the signal driver B

13 [] Scan Driver

14a, 14b Signal electrode

16 27 Liquid crystal panel

31a, 31b, 41a, 41b Data signal line

22 40 Inverter circuit

34a, 44a Scan driver A

34b, 44b Scan driver B

37a, 37b, 47a, 47b Clock signal line

38a, 38b, 48a, 48b Clock signal line

39 49 Liquid crystal panel

111a, 111b, 121a, 121b Data signal line

112a [] the signal driver A

112b [] the signal driver B

113 [] Scan Driver

114a, 114b Signal electrode

116 126 Liquid crystal panel

131a, 131b, 141a, 141b Data signal line

129 149 Phase conversion circuit

133a, 143a Scan driver A

134b, 143b Scan driver B

137a, 137b, 147a, 147b Clock signal line

138a, 138b, 148a, 148b Control signal line